

Attorney Docket No. 249432US2SRDDIV
Inventor: Takeshi UENO et al
Preliminary Amendment filed: March 2, 2004

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Claims 1-22 (canceled)

23 (new). A balanced amplifier comprising:

a first voltage-to-current converter and a second voltage-to-current converter, each including

- a first input terminal,
- a second input terminal,
- a first output terminal, and
- a second output terminal,

each of the voltage-to-current converters converting input voltages applied to each of the first input terminal and the second input terminal into output currents output from both of the first and second output terminals;

wherein the second input and output terminals of the first and second voltage-to-current converters are connected in common.

24 (new). The balanced amplifier according to claim 23, wherein each of the converters comprises a common source amplifier.

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25 (new). The balanced amplifier according to claim 23, further comprising:
a first impedance connected between the first input and output terminals of the first voltage-to-current converter; and
a second impedance connected between the first input and output terminals of the second voltage-to-current converter.

26 (new). The balanced amplifier according to claim 25, further comprising:
a first input side impedance connected to the first input terminal of the first voltage-to-current converter; and
a second input side impedance connected to the first input terminal of the second voltage-to-current converter.

27 (new). The balanced amplifier according to claim 23, wherein:
each of the first and second voltage-to-current converters further includes,
a first current source which outputs a first current, and
a second current source which outputs a second current,
the first output terminal of each of the first and second voltage-to-current converters outputs a third current,
the second output terminal of each of the first and second voltage-to-current converters outputs a fourth current,
the third current is obtained by subtracting a sum current from the first current, the sum

current corresponding to a sum of currents corresponding to voltages applied to the first and second input terminals, and

the fourth current is obtained by subtracting the sum current from the second current.

28 (new). The balanced amplifier according to claim 27, further comprising:

a first impedance connected between the first input terminal and the first output terminal of the first voltage-to-current converter; and

a second impedance connected between the first input terminal and the first output terminal of the second voltage-to-current converter.

29 (new). The balanced amplifier according to claim 28, further comprising:

a first input side impedance connected to the first input terminal of the first voltage-to-current converter; and

a second input side impedance connected to the first input terminal of the second voltage-to-current converter.

30 (new). The balanced amplifier according to claim 28, further comprising:

a first single-phase input/single-phase output voltage-to-current converter having an output side connected to the first input terminal of the first voltage-to-current converter; and

a second single-phase input/single-phase output voltage-to-current converters having an output side is connected to the first input terminal of the second voltage-to-current converter.

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31 (new). A common-mode reduction filter comprising the balanced amplifier according to claim 28.

32 (new). The balanced amplifier according to claim 27, further comprising:
a third voltage-to-current converter having a configuration equal to that of each of the first voltage-to-current converter and the second voltage-to-current converter: and
the third voltage-to-current converter having a second input terminal and a second output terminal connected to the first input terminal of the first voltage-to-current converter, and
a second input terminal and a second output terminal of the third voltage-to-current converter are connected to the first input terminal of the second voltage-to-current converter.

33 (new). The balanced amplifier according to claim 32, wherein:
each of the first voltage-to-current converter, the second voltage-to-current converter, and the third voltage-to-current converter comprises a third input terminal and a fourth input terminal, and
the first current source and the second current source supply a sum current corresponding to a sum of the currents corresponding to voltages applied to the third input terminal and the fourth input terminal to the first output terminal and the second output terminal of each of the first voltage-to-current converter and the second voltage-to-current

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converter.

34 (new). The balanced amplifier according to claim 32, wherein each of the first voltage-to-current converter, the second voltage-to-current converter and the second voltage-to-current converter includes a first power line and a second power line, and two transistors connected in series between the first power line and the second power line.

35 (new). A common-mode reduction filter comprising the balanced amplifier according to claim 32,

36 (new). The balanced amplifier according to claim 27, wherein each of the first voltage-to-current converter and the second voltage-to-current converter comprise a third input terminal and a fourth input terminal, and

the first current source and the second current source supply a sum current corresponding to sum of the currents corresponding to voltages applied to the third input terminal and the fourth input terminal to the first output terminal and the second output terminal of each of the first voltage-to-current converter and the second voltage-to-current converter.

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37 (new). The balanced amplifier according to claim 27, wherein each of the first voltage-to-current converter and the second voltage-to-current converter include a first power line and a second power line, and two transistors connected in series between the first power line and the second power line.